

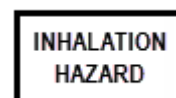


CAMEO Chemicals




Chemical Datasheet

AMMONIA, ANHYDROUS



Chemical Identifiers

CAS Number UN/NA Number DOT Hazard Label





7664-41-7  1005

Non-Flammable Gas (domestic)
Inhalation Hazard (Special Provision 13) (domestic)
Poison Gas (international)
Corrosive (international)

USCG CHRIS Code

AMA

NFPA 704

Diamond	Hazard	Value	Description
<div>1</div> <div>3 0</div>	 Health	3	Can cause serious or permanent injury.
	 Flammability	1	Must be preheated before ignition can occur.
	 Instability	0	Normally stable, even under fire conditions.
	 Special		

Note: The Refrigeration System Classification section of the International Mechanical Code requires a value of 3 for the red quadrant (flammability hazard) for indoor ammonia refrigeration equipment. (NFPA, 2010)

NIOSH Pocket Guide

Ammonia

International Chem Safety Card

AMMONIA (ANHYDROUS)

General Description

A clear colorless gas with a strong odor. Shipped as a liquid under its own vapor pressure. Density (liquid) 6 lb / gal. Contact with the unconfined liquid can cause frostbite. Gas generally regarded as nonflammable but does burn within certain vapor concentration limits and with strong ignition. Fire hazard increases in the presence of oil or other combustible materials. Although gas is lighter than air, vapors from a leak initially hug the ground. Prolonged exposure of containers to fire or heat may cause violent rupturing and rocketing. Long-

term inhalation of low concentrations of the vapors or short-term inhalation of high concentrations has adverse health effects. Used as a fertilizer, as a refrigerant, and in the manufacture of other chemicals.

Rate of onset: Immediate

Persistence: Minutes

Odor threshold: 17 ppm

Source/use/other hazard: Explosives manufacture; pesticides; detergents industry.

Hazards

Reactivity Alerts



Water-Reactive

Air & Water Reactions

Soluble in water with evolution of heat. The amount of heat generated may be large.

Fire Hazard

Mixing of ammonia with several chemicals can cause severe fire hazards and/or explosions. Ammonia in container may explode in heat of fire. Incompatible with many materials including silver and gold salts, halogens, alkali metals, nitrogen trichloride, potassium chlorate, chromyl chloride, oxygen halides, acid vapors, azides, ethylene oxide, picric acid and many other chemicals. Mixing with other chemicals and water. Hazardous polymerization may not occur. (EPA, 1998)

Health Hazard

Vapors cause irritation of eyes and respiratory tract. Liquid will burn skin and eyes. Poisonous; may be fatal if inhaled. Contact may cause burns to skin and eyes. Contact with liquid may cause frostbite. (EPA, 1998)

Reactivity Profile

AMMONIA is a base. Reacts exothermically with all acids. Violent reactions are possible. Readily combines with silver oxide or mercury to form compounds that explode on contact with halogens. When in contact with chlorates it forms explosive ammonium chlorate [Kirk-Othmer, 3rd ed., Vol. 2, 1978, p. 470]. Reacts violently or produces explosive products with fluorine, chlorine, bromine and iodine and some of the interhalogen compounds (bromine pentafluoride, chlorine trifluoride). Mixing of bleaching powder (hypochlorite solution) with ammonia solutions produces toxic/explosive ammonia trichloride vapors. Undergoes potentially violent or explosive reactions on contact with 1,2-dichloroethane (with liquid ammonia), boron halides, ethylene oxide (polymerization), perchlorates or strong oxidants (chromyl chloride, chromium trioxide, chromic acid, nitric acid, hydrogen peroxide, chlorates, fluorine, nitrogen oxide, liquid oxygen). Reacts with silver chloride, silver oxide, silver nitrate or silver azide to form the explosive silver nitride. May react with some heavy metal compounds (mercury, gold(III) chloride) to produce materials that may explode when dry. [Bretherick, 5th ed., 1995, p. 1553].

Belongs to the Following Reactive Group(s)

- Bases, Weak

Potentially Incompatible Absorbents

No information available.

Response Recommendations

Isolation and Evacuation

Excerpt from ERG Guide 125 [Gases - Corrosive]:

As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions.

SPILL: See ERG Tables 1 and 3 - Initial Isolation and Protective Action Distances on the UN/NA 1005 datasheet.

FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. (ERG, 2016)

Firefighting

Wear positive pressure breathing apparatus and full protective clothing.

Small fires: dry chemical or carbon dioxide. Large fires: water spray, fog or foam. Apply water gently to the surface. Do not get water inside container. Move container from fire area if you can do it without risk. Stay away from ends of tanks. Cool containers that are exposed to flames with water from the side until well after fire is out. Isolate area until gas has dispersed. (EPA, 1998)

Non-Fire Response

Excerpt from ERG Guide 125 [Gases - Corrosive]:

Fully encapsulating, vapor-protective clothing should be worn for spills and leaks with no fire. Do not touch or walk through spilled material. Stop leak if you can do it without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Prevent entry into waterways, sewers, basements or confined areas. Do not direct water at spill or source of leak. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Isolate area until gas has dispersed. (ERG, 2016)

Protective Clothing

For emergency situations, wear a positive pressure, pressure-demand, full facepiece self-contained breathing apparatus (SCBA) or pressure-demand supplied air respirator with escape SCBA and a fully-encapsulating, chemical resistant suit. (EPA, 1998)

DuPont Tychem® Suit Fabrics

Normalized Breakthrough Times (in Minutes)

Chemical	CAS Number	State	QC	SL	TF	TP	C3	BR	RC	TK	RF
Ammonia (gas)	7664-41-7	Vapor	imm.	26	20	90	imm.	133	133	>480	>480
Ammonia (liquid, < -35°C)	7664-41-7	Liquid				>480	>480			>480	>480
Anhydrous ammonia (gas)	7664-41-7	Vapor	imm.	26	20	90	imm.	133	133	>480	>480

Chemical	CAS Number	State	QC	SL	TF	TP	C3	BR	RC	TK	RF
Anhydrous ammonia (liquid, < -35°C)	7664-41-7	Liquid				>480	>480			>480	>480

> indicates greater than.

"imm." indicates immediate; having a normalized breakthrough time of 10 minutes or less.

A blank cell indicates the fabric has not been tested. The fabric may or may not offer barrier.

Special Warnings from DuPont

1. Serged and bound seams are degraded by some hazardous liquid chemicals, such as strong acids, and should not be worn when these chemicals are present.
2. CAUTION: This information is based upon technical data that DuPont believes to be reliable. It is subject to revision as additional knowledge and experience are gained. DuPont makes no guarantee of results and assumes no obligation or liability...

(DuPont, 2016)

First Aid

Warning: Ammonia is extremely corrosive to the skin, eyes, and mucous membranes. Contact with the liquified gas may cause frostbite. Caution is advised.

Signs and Symptoms of Acute Ammonia Exposure: Inhalation of ammonia may cause irritation and burns of the respiratory tract, laryngitis, dyspnea (shortness of breath), stridor (high-pitched respirations), and chest pain. Pulmonary edema and pneumonia may also result from inhalation. A pink frothy sputum, convulsions, and coma are often seen following exposure to high concentrations. When ammonia is ingested, nausea and vomiting may result; oral, esophageal, and stomach burns are common. If ammonia has contacted the eyes, irritation, pain, conjunctivitis (red, inflamed eyes), lacrimation (tearing), and corneal erosion may occur. Loss of vision is possible. Dermal exposure may result in severe burns and pain.

Emergency Life-Support Procedures: Acute exposure to ammonia may require decontamination and life support for the victims. Emergency personnel should wear protective clothing appropriate to the type and degree of contamination. Air-purifying or supplied-air respiratory equipment should also be worn, as necessary.

Inhalation Exposure:

1. Move victims to fresh air. Emergency personnel should avoid self-exposure to ammonia.
2. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer oxygen or other respiratory support.
3. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.
4. Transport to a health care facility.

Dermal/Eye Exposure:

1. Remove victims from exposure. Emergency personnel should avoid self-exposure to ammonia.
2. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer oxygen or other respiratory support. Warning: Do not attempt to neutralize with an acid wash; excessive liberation of heat may result.
3. If eye exposure has occurred, eyes must IMMEDIATELY be flushed with lukewarm water for at least 15 minutes.
4. Remove contaminated clothing as soon as possible.

5. Wash exposed skin areas THOROUGHLY with soap and water.
6. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.
7. Transport to a health care facility.

Ingestion Exposure:

1. Evaluate vital signs including pulse and respiratory rate, and note any trauma. If no pulse is detected, provide CPR. If not breathing, provide artificial respiration. If breathing is labored, administer oxygen or other respiratory support.
2. DO NOT induce vomiting or attempt to neutralize!
3. Obtain authorization and/or further instructions from the local hospital for administration of an antidote or performance of other invasive procedures.
4. Activated charcoal does not strongly bind ammonia, and therefore is of little or no value.
5. Give the victims water or milk: children up to 1 year old, 125 mL (4 oz or 1/2 cup); children 1 to 12 years old, 200 mL (6 oz or 3/4 cup); adults, 250 mL (8 oz or 1 cup). Water or milk should be given only if victims are conscious and alert.
6. Transport to a health care facility. (EPA, 1998)

Physical Properties**Chemical Formula:** H₃N

Flash Point: data unavailable

Lower Explosive Limit (LEL): 16 % (EPA, 1998)

Upper Explosive Limit (UEL): 25 % (EPA, 1998)

Autoignition Temperature: 1204 ° F (USCG, 1999)

Melting Point: -107.9 ° F (EPA, 1998)

Vapor Pressure: 400 mm Hg at -49.72 ° F (EPA, 1998)

Vapor Density (Relative to Air): 0.6 (EPA, 1998)

Specific Gravity: 0.6818 at -28.03 ° F (EPA, 1998)

Boiling Point: -28.03 ° F at 760 mm Hg (EPA, 1998)

Molecular Weight: 17.03 (EPA, 1998)

Water Solubility: data unavailable

Ionization Potential: 10.18 eV (NIOSH, 2016)

IDLH: 300 ppm (NIOSH, 2016)


AEGLs (Acute Exposure Guideline Levels)**Final AEGLs for Ammonia (7664-41-7)**


Exposure Period	AEGL-1	AEGL-2	AEGL-3
10 minutes	30 ppm	220 ppm	2700 ppm
30 minutes	30 ppm	220 ppm	1600 ppm
60 minutes	30 ppm	160 ppm	1100 ppm
4 hours	30 ppm	110 ppm	550 ppm
8 hours	30 ppm	110 ppm	390 ppm

Exposure Period	AEGL-1	AEGL-2	AEGL-3
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(NAC/NRC, 2016)

ERPGs (Emergency Response Planning Guidelines)

Chemical	ERPG-1	ERPG-2	ERPG-3
Ammonia (7664-41-7)	25 ppm 	150 ppm	1500 ppm

 indicates that odor should be detectable near ERPG-1.

(AIHA, 2016)

PACs (Protective Action Criteria)

Chemical	PAC-1	PAC-2	PAC-3	
Ammonia (7664-41-7)	30 ppm	160 ppm	1100 ppm	LEL = 150000 ppm

(DOE, 2016)

Regulatory Information

EPA Consolidated List of Lists

Regulatory Name	CAS Number/ 313 Category Code	EPCRA 302 EHS TPQ	EPCRA 304 EHS RQ	CERCLA RQ	EPCRA 313 TRI	RCRA Code	CAA 112(r) RMP TQ
Ammonia	7664-41-7	500 pounds	100 pounds	100 pounds			
Ammonia (anhydrous)	7664-41-7	500 pounds	100 pounds	100 pounds	X		10000 pounds
Ammonia (conc 20% or greater)	7664-41-7			see ammonium hydroxide	X		20000 pounds
Ammonia (includes anhydrous ammonia and aqueous ammonia from water dissociable ammonium salts and other sources; 10 percent of total aqueous ammonia is reportable under this listing)	7664-41-7				313		

"X" indicates that this is a second name for an EPCRA section 313 chemical already included on this consolidated list. May also indicate that the same chemical with the same CAS number appears on another list with a different chemical name.

(EPA List of Lists, 2015)

DHS Chemical Facility Anti-Terrorism Standards (CFATS)

Chemical of Interest	CAS Number	RELEASE			THEFT			SABOTAGE		
		Min Conc	STQ	Security Issue	Min Conc	STQ	Security Issue	Min Conc	STQ	Security Issue
Ammonia (anhydrous)	7664-41-7	1.00 %	10000 pounds	toxic						
Ammonia (conc. 20% or greater)	7664-41-7	20.00 %	20000 pounds	toxic						

(DHS, 2007)

Alternate Chemical Names

- AM-FOL
- AMMONIA
- AMMONIA (ANHYDROUS)
- AMMONIA (ANHYDROUS) (LIQUEFIED)
- AMMONIA GAS
- AMMONIA SOLUTION, WITH MORE THAN 50% AMMONIA
- AMMONIA, ANHYDROUS
- AMMONIA, ANHYDROUS, LIQUEFIED
- AMMONIA, [ANHYDROUS]
- AMMONIA-14N
- ANHYDROUS AMMONIA
- ANHYDROUS AMMONIA, LIQUEFIED
- AQUA AMMONIA
- AQUEOUS AMMONIA
- LIQUID AMMONIA
- NITRO-SIL
- R 717
- REFRIGERENT R717
- SPIRIT OF HARTSHORN



CAMEO Chemicals



Chemical Datasheet

LEAD

Chemical Identifiers

CAS Number	UN/NA Number	DOT Hazard Label	USCG CHRIS Code
7439-92-1	none	data unavailable	none

NFPA 704

data unavailable

NIOSH Pocket Guide

Lead

International Chem Safety Card

LEAD

General Description

PHYSICAL DESCRIPTION: Soft silver-bluish white to gray metal. (NTP, 1992)

Hazards

Reactivity Alerts

none

Air & Water Reactions

Insoluble in water.

Fire Hazard

Flash point data for this compound are not available, however, it is probably non-combustible. (NTP, 1992)

Health Hazard

Exposure Routes: inhalation, ingestion, skin and/or eye contact

Symptoms: Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypotension

Target Organs: Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue (NIOSH, 2016)

Reactivity Profile

In the presence of carbon, the combination of chlorine trifluoride with aluminum, copper, lead, magnesium, silver, tin, or zinc results in a violent reaction [Mellor 2, Supp. 1: 1956]. A solution of sodium azide in copper pipe with lead joints formed copper and lead azide, both are detonating compounds [Klotz 1973]. Sodium acetylide becomes pyrophoric when mixed with metals like lead. Mixtures of trioxane with 60% hydrogen peroxide in contact with metallic lead when heated detonated. Lead containing rubber ignited in a nitric acid atmosphere. Lead is incompatible with strong oxidants such as: ammonium nitrate, chlorine trifluoride, hydrogen peroxide, etc.

Belongs to the Following Reactive Group(s)

- Metals, Less Reactive

Potentially Incompatible Absorbents

No information available.

Response Recommendations

Isolation and Evacuation

No information available.

Firefighting

Fires involving this material can be controlled with a dry chemical, carbon dioxide, foam, or Halon extinguisher. (NTP, 1992)

Non-Fire Response

STORAGE PRECAUTIONS: You should store this chemical under refrigerated temperatures, and keep it away from oxidizing materials. (NTP, 1992)

Protective Clothing

Skin: Wear appropriate personal protective clothing to prevent skin contact.

Eyes: Wear appropriate eye protection to prevent eye contact.

Wash skin: The worker should wash daily at the end of each work shift.

Remove: Work clothing that becomes wet or significantly contaminated should be removed and replaced.

Change: Workers whose clothing may have become contaminated should change into uncontaminated clothing before leaving the work premise. (NIOSH, 2016)

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No information available.

First Aid

EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center.

Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. If symptoms such as redness or irritation develop, IMMEDIATELY call a physician and be prepared to transport the victim to a hospital for treatment.

INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. IMMEDIATELY call a physician and be prepared to transport the victim to a hospital even if no symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

INGESTION: Some heavy metals are VERY TOXIC POISONS, especially if their salts are very soluble in water (e.g., lead, chromium, mercury, bismuth, osmium, and arsenic). IMMEDIATELY call a hospital or poison control center and locate activated charcoal, egg whites, or milk in case the medical advisor recommends administering one of them. Also locate Ipecac syrup or a glass of salt water in case the medical advisor recommends inducing vomiting. Usually, this is NOT RECOMMENDED outside of a physician's care. If advice from a physician is not readily available and the victim is conscious and not convulsing, give the victim a glass of activated charcoal slurry in water or, if this is not available, a glass of milk, or beaten egg whites and IMMEDIATELY transport victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, assure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital.

OTHER: Since this chemical is a known or suspected carcinogen you should contact a physician for advice regarding the possible long term health effects and potential recommendation for medical monitoring. Recommendations from the physician will depend upon the specific compound, its chemical, physical and toxicity properties, the exposure level, length of exposure, and the route of exposure. (NTP, 1992)

Physical Properties

Chemical Formula: Pb

Flash Point: data unavailable

Lower Explosive Limit (LEL): data unavailable

Upper Explosive Limit (UEL): data unavailable

Autoignition Temperature: data unavailable

Melting Point: 621.5 ° F (NTP, 1992)

Vapor Pressure: 1.77 mm Hg (NTP, 1992)

Vapor Density (Relative to Air): data unavailable

Specific Gravity: 11.3437 at 61 ° F (NTP, 1992)

Boiling Point: 3164 ° F at 760 mm Hg (NTP, 1992)

Molecular Weight: 207.19 (NTP, 1992)

Water Solubility: Insoluble (NTP, 1992)

Ionization Potential: data unavailable

IDLH: 100 mg/m³ (as Pb) (NIOSH, 2016)

AEGLs (Acute Exposure Guideline Levels)

No AEGL information available.

ERPGs (Emergency Response Planning Guidelines)

No ERPG information available.

PACs (Protective Action Criteria)

Chemical	PAC-1	PAC-2	PAC-3
Lead (7439-92-1)	0.15 mg/m ³	120 mg/m ³	700 mg/m ³

(DOE, 2016)

Regulatory Information

EPA Consolidated List of Lists

Regulatory Name	CAS Number/ 313 Category Code	EPCRA 302 EHS TPQ	EPCRA 304 EHS RQ	CERCLA RQ	EPCRA 313 TRI	RCRA Code	CAA 112 (r) RMP TQ
Lead	7439-92-1			10 pounds	313		
Lead Compounds	N420			&	313		

& indicates that no RQ is assigned to this generic or broad class, although the class is a CERCLA hazardous substance. See 50 Federal Register 13456 (April 4, 1985).

(EPA List of Lists, 2015)

DHS Chemical Facility Anti-Terrorism Standards (CFATS)

No regulatory information available.

Alternate Chemical Names

- C.I. 77575
- C.I. PIGMENT METAL 4
- KS-4
- LEAD
- LEAD ELEMENT
- LEAD FLAKE
- LEAD METAL
- LEAD S 2
- LEAD SZ
- PB-S 100
- PLUMBUM
- SSO 1